# Drug Regimen Simplification

**Prepared for Kansas Medical Assistance Program in October, 2005**

## EXECUTIVE SUMMARY

Purpose of Intervention

The primary purpose of this clinical intervention was to analyze prescription claims data and determine opportunities to simplify drug regimens and decrease associated costs. A secondary outcome was to measure recipient compliance in those who were candidates for drug regimen simplification.

Intervention

| Intervention Type | Population-based mailing |
|---|---|
| Intervention Mailing Date | February 24, 2005 |
| Pre-intervention Period (Baseline) | September 2004 – February 2005 |
| Post-intervention Period (Post) | April 2005 – September 2005 |
| Number of Targeted Physicians | 381 |
| Number of Targeted Patients | 557 |
| Adjusted Targeted Patients | 292 |

## RESULTS

Thirty-Seven (13.4%) of the adjusted target patients changed to the recommended therapy with a resulting monthly savings of $2,984 ($35,808 annualized). Additionally, 10 (66.7%) of the non-compliant patients became compliant during the post-intervention period.

### Changes in Clinical Indicators

| Clinical Indicators | Target | | |
|---|---|---|---|
| | Baseline | Sep-05 | % Change |
| **Non-Compliance** | **15** | **5** | **-66.7%** |
| **Drug Regimen Simplification** | **277** | **152** | **-45.1%** |

### Intervention Savings

| Drug | Monthly Cost Savings (Per Patient) | Annualized Savings (Per Patient) |
|---|---|---|
| **Angiotensin Converting Enzyme Inhibitors** | **$0.00 ($0.00)** | **$0.00 ($0.00)** |
| **Angiotensin Receptor Blocker** | **$0.00 ($0.00)** | **$0.00 ($0.00)** |
| **Antipsychotics** | **$2,256.51 ($176.28)** | **$27,078.12 ($2,115.36)** |
| **HMG CoA Reductase Inhibitors** | **$368.48 ($184.24)** | **$4,421.76 ($2,210.88)** |
| **Calcium Channel Blockers** | **$0.00 ($0.00)** | **$0.00 ($0.00)** |
| **Miscellaneous Agents** | **$103.11 ($103.11)** | **$1,237.32 ($1,237.32)** |
| **Proton Pump Inhibitors** | **-$20.97 (-$20.97)** | **-$251.64 (-$251.64)** |
| **SSRI Agents** | **$276.85 ($55.37)** | **$3,322.20 ($664.44)** |
| **Total** | **$2,983.98** | **$35,807.76** |

## BACKGROUND

***Cost Issue***

Healthcare costs are mounting with the United States investing $1.1 trillion (13.5%) of the gross domestic product in the health care sector each year. This number is expected to exceed $2 trillion (16.6%) by 2007.[1] A major driving force for these healthcare cost trends is increases in pharmaceutical costs which have been reported to range from 17.3% to 34.8% annually.[2] Drug costs for the Minnesota Medicaid FFS program have risen to $334 million annually, which yields a 30% increase per recipient over the last six years. In fact, pharmaceutical cost growth is based on a number of factors: 1) growing prevalence of identified and treated disease, 2) aging of the population, 3) increasing number of different medications per recipient, 4) introduction of new, costly therapeutic agents to the market, and 5) increasing drug prices or inflation.[3] It has also been reported that physicians are not familiar with the prices of medications but are willing to consider costs when prescribing.[4,5]

This cost saving intervention is for select target drugs where the dosing interval is 'once daily' but prescription claim analysis has identified that recipient's are using two tablets per day. It is unknown from claims data if recipients are taking one tablet twice a day or two tablets once daily. However, the cost savings warrants alerting prescribers and pharmacists where opportunities exist to simplify the recipient's drug regimen and save drug costs.

Refer to Attachment A for the education insert that states cost savings per drug change.

Potential cost savings for this intervention if all targets switched (100% conversion) was estimated to be $1.2 Million (including DHS rebate savings). State share is 50% or $600,000.

***Compliance Issue***

On an annual basis, about 50% of prescribed medications are taken incorrectly with associated costs of $100 billion annually.[3] Factors such as dosing frequency influence medication compliance and simplifying a recipient's prescribed medication regimen is a well-recognized method to increase medication compliance. Once and twice daily dosing regimens have a much higher compliance rate than three or four times daily dosing regimens. In a study with antihypertensive medications, compliance increased from 59% for three times daily dosing to 84% with once daily dosing. In a separate study, compliance rates for medications prescribed one, two, three or four times daily were 87%, 81%, 77%, and 39%, respectively.[6]

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[1] Institute of Medicine. Crossing the quality chasm: a new health system for the 21st century. Washington, DC: National Academy Press, 2001.

[2] Chernew M, Smith DG, Kirking DM, Fendrick AM. Decomposing pharmaceutical cost growth in different types of health plans. Am J Manag Care. 2001;7:667-673.

[3] Ernst, Micheal, etal. Prescription medication costs. Arch Fam Med. 2000; 9: 1002-1007.

[4] Reichert, Steven, et. Al. Physicians' Attitudes about prescribing and knowledge of the costs of common medications. Arch Intern Med. 2000; 160: 2799-2803.

[5] Dubois RW, Shawla AJ, Neslusan CA, Smith MW, Wade S. Explaining drug spending trends: does perception match reality? Health Aff 2000;19(2):231-239.

[6] Leenen FH, et al. Patterns of compliance with once versus twice daily antihypertensive drug therapy in primary care: a randomized clinical trial using electronic monitoring. Can J Cardiology. 1997;13(10): 914-920.

## METHODOLOGY

Changes in intervention-related pharmacy dollars paid and pharmacy dollars paid per patient per month (PPPM) were examined. To assess the impact of the intervention, pharmacy drug claims were reviewed from April 2005 through September 2005.

Clinical Criteria: Criteria, rationale, and text message(s) to providers are listed below. All physicians with at least one recipient "hitting" on criteria received letters.

- Drug Regimen Simplification
  The drug regimen simplification indicator looked at patients taking 2 dosage units of targeted medications per day.

  Rationale: By simplifying drug regimens, medication compliance may increase and pharmaceutical expenditures may decrease.

  Sample Provider Paragraph:

  > According to submitted pharmacy claims data, it appears that your patient may be a candidate for drug regimen simplification. For the medication listed above, your patient is currently receiving multiple dosage units per day. Most patients receive adequate therapeutic effect with once-daily dosing of this product. Please refer to the attached chart for available dosage strengths to determine if your patient would benefit from a once-daily, single dosage unit of this drug.

- Medication Non-Compliance
  The drug therapy compliance indicator looked at patients taking chronic drug therapy who received less than 75 days supply of the drug during a 90-day period of time.

  Rationale: Compliance with prescribed maintenance drug regimens is paramount to successful patient outcomes. More than $100 billion is spent yearly for problems related to noncompliance. Over half of written prescriptions are taken incorrectly.[7]

  Sample Provider Paragraph:

  > Your patient may be non-compliant with the identified drug therapy. From prescription data, it appears that your patient received <60 days of maintenance therapy in a 90-day period. Drug regimen simplification may improve medication compliance. Please review this information to determine the best course of action for your patient.

Definitions:

**Adjusted Target Patients** – All patients of physicians who were included in the intervention, who had pharmacy claims and were active plan members throughout the post-intervention time period. Additionally, when outcomes are performed, these patients' pre-intervention (baseline) hits are re-evaluated to make certain that the status of clinical indicators haven't changed for each patient due to a lag in pharmacy and medical claims.

**Intervention-Related Drugs** – Monopril® (fosinopril), Zestril®/Prinvil® (lisinopril), Univasc® (moexipril), Aceon® (perindopril), Altace® (ramipril), Mavik® (trandolapril), Atacand® (candesartan), Avapro® (irbesartan), Cozaar® (losartan), Benicar® (olmesartan), Micardis® (telmisartan), Diovan® (valsartan), Zyprexa® (olanzapine), Abilify® (aripiprazole), Lipitor® (atorvastatin), Lescol® (fluvastatin), Mevacor® (lovastatin), Altoprev® (Lovastatin SR), Pravachol® (pravastatin), Crestor® (rosuvastatin), Zocor® (simvastatin), Norvasc® (amlodipine), Plendil® (felodipine), Procardia XL®/Adalat CC® (nifedipine ER), Sular®

[7] Berg JS, et.al. Medication compliance: a health care problem. Ann Pharmacother. 1993;27(9 suppl):S5-S19.

(nisoldipine), Bextra® (valdecoxib), Effexor XR® (venlafaxine XR), Nexium® (esomeprazole), Prevacid® (lansoprazole), Prilosec® (omeprazole), Protonix® (pantoprazole), Celexa® (citalopram), Lexapro® (escitalopram), Paxil® (paroxetine), Zoloft® (sertraline)

## RESULTS

***Drug regimen simplification and cost savings***

Patients' drug profiles were reviewed for changes to the recommended drug dosing. This could occur at any point during the post-intervention evaluation period. Cost savings were calculated for recipients who switched by calculating the cost difference between the original therapy and the new therapy on a monthly basis. Monthly savings for each recipient and for each drug were summed and provided as total monthly savings for the targeted drugs, and then annualized.

Two hundred and sixty-five patients were dropped from the post-intervention analysis due to lack of continuous eligibility or no longer hitting on a clinical indicator at baseline (due to late claims). Table 2 exhibits the baseline "hits" for the adjusted targeted patients, the adjusted target patients still hitting in the post-intervention month of September 2005, patients who switched therapy as recommended, and monthly and annual savings. Overall, 37 (13.4%) of the adjusted targeted patients switched to the recommended therapy while 152 (54.9%) patients continued on their current therapy (as determined by targeted drugs still "hitting" on the 2 tablets per day criteria). Monthly cost reductions associated with recipients switching to the recommended therapy were $2,984, or a projected annualized savings of $35,808.

A sizable number of patients using mental health drugs changed their prescribing habits and therefore, cost savings were seen:

- Atypical antipsychotics: 14.5% of patients switched to the recommended therapy with an average annual savings per recipient of $1,057.68.
- Antidepressants: 13.2% of patients switched to the recommended therapy with an average annual savings per recipient of $664.44.

In the cardiovascular drug categories, there was a similarly impressive change per recipient:

- HMG-CoA inhibitors: 19.0% of patients switched to the recommended therapy with an average annual savings per recipient of $1,646.76.

Additionally, 88 (31.8%) recipients changed therapy within the same class (i.e., increase or decrease in dose or discontinued the therapy) during the six month post-intervention evaluation period.

## Table 2: Drug Regimen Simplification Outcomes Analysis

| Drug | Baseline | Sep-05 | Patients Switching to Recommended Therapy | Monthly Cost Savings* (Per Patient) | Annualized Savings (Per Patient) |
|---|---|---|---|---|---|
| **Angiotensin Converting Enzyme Inhibitors** | | | | | |
| Monopril® | 1 | 0 | 0 | $0.00 ($0.00) | $0.00 ($0.00) |
| Zestril®/Prinivil® | 3 | 3 | 0 | $0.00 ($0.00) | $0.00 ($0.00) |
| Univasc® | 0 | 0 | 0 | - - | - - |
| Aceon® | 0 | 0 | 0 | - - | - - |
| Altace™ | 0 | 0 | 0 | - - | - - |
| Mavik® | 0 | 0 | 0 | - - | - - |
| **Angiotensin Receptor Blockers** | | | | | |
| Atacand® | 0 | 0 | 0 | - - | - - |
| Avapro® | 0 | 0 | 0 | - - | - - |
| Cozaar® | 7 | 5 | 0 | $0.00 ($0.00) | $0.00 ($0.00) |
| Benicar® | 0 | 0 | 0 | - - | - - |
| Micardis® | 0 | 0 | 0 | - - | - - |
| Diovan™ | 0 | 0 | 0 | - - | - - |
| **Antipsychotics** | | | | | |
| Zyprexa® | 117 | 67 | 17 | $1,598.51 ($94.03) | $19,182.12 ($1,128.36) |
| Abilify® | 56 | 23 | 8 | $658.00 ($82.25) | $7,896.00 ($987.00) |
| **HMG CoA Reductase Inhibitors** | | | | | |
| Lipitor® | 16 | 9 | 2 | $180.44 ($90.22) | $2,165.28 ($1,082.64) |
| Lescol® | 0 | 0 | 0 | - - | - - |
| Mevacor®/ Altoprev® | 0 | 0 | 0 | - - | - - |
| Pravachol® | 0 | 0 | 0 | - - | - - |
| Crestor® | 1 | 1 | 0 | $0.00 ($0.00) | $0.00 ($0.00) |
| Zocor® | 4 | 0 | 2 | $188.04 ($94.02) | $2,256.48 ($1,128.24) |

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| Drug | Baseline | Sep-05 | Patients Switching to Recommended Therapy | Monthly Cost Savings* (Per Patient) | Annualized Savings (Per Patient) |
|---|---|---|---|---|---|
| **Calcium Channel Blockers** | | | | | |
| Norvasc® | 7 | 5 | 0 | $0.00<br>($0.00) | $0.00<br>($0.00) |
| Plendil® | 0 | 0 | 0 | -<br>- | -<br>- |
| Procardia XL /Adalat CC® | 5 | 5 | 0 | $0.00<br>($0.00) | $0.00<br>($0.00) |
| Sular® | 1 | 0 | 0 | $0.00<br>($0.00) | $0.00<br>($0.00) |
| **Miscellaneous Agents** | | | | | |
| Bextra® | 0 | 0 | 0 | -<br>- | -<br>- |
| Effexor XR® | 12 | 6 | 1 | $103.11<br>($103.11) | $1,237.32<br>($1,237.32) |
| **Proton Pump Inhibitors** | | | | | |
| Nexium™ | 2 | 1 | 1 | -$4.14<br>(-$4.14) | -$49.68<br>(-$49.68) |
| Prevacid® | 0 | 0 | 0 | -<br>- | -<br>- |
| Prilosec™ | 7 | 3 | 1 | -$16.83<br>(-$16.83) | -$201.96<br>(-$201.96) |
| Protonix® | 0 | 0 | 0 | -<br>- | -<br>- |
| **SSRI Agents** | | | | | |
| Celexa™ | 0 | 0 | 0 | -<br>- | -<br>- |
| Lexapro® | 0 | 0 | 0 | -<br>- | -<br>- |
| Paxil™ | 4 | 4 | 0 | $0.00<br>($0.00) | $0.00<br>($0.00) |
| Zoloft® | 34 | 20 | 5 | $276.85<br>($55.37) | $3,322.20<br>($664.44) |
| **Total** | 277 | 152 | 37 | $2,983.98 | $35,807.76 |

*Monthly cost savings are calculated for all patients who have switched therapy with continuous claims

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***Non-Compliance with Medication***

Table 3 exhibits the change in the incidence of patients identified as being non-compliant with their therapy. Overall, a reduction in non-compliance with therapy clinical indicators of 66.7% was achieved during the post-intervention period.

**Table 3: Changes in Non-Compliance**

| Non-Compliance | Target | | |
|---|---|---|---|
| | Baseline | Sep-05 | % Change |
| Atorvastatin | 1 | 1 | 0.0% |
| Lisinopril | 1 | 0 | -100.0% |
| Nifedipine SR | 1 | 1 | 0.0% |
| Olanzapine | 8 | 2 | -75.0% |
| Paroxetine | 1 | 0 | -100.0% |
| Sertraline | 2 | 0 | -100.0% |
| Simvastatin | 1 | 1 | 0.0% |
| Total | 15 | 5 | -66.7% |

## LIMITATIONS

The time frame of 6 months may not capture the full extent of the impact of the drug regimen simplification intervention. Providers may be required some time before they can change their patient's drug regimens. Additionally, if this study included only users of chronic medications, this may have more accurately reflected the pharmacy cost changes in the target group.

## CONCLUSIONS

Of the 557 targeted recipients, 265 recipients were dropped from the analysis due to inconsistent or lack of eligibility or no longer hitting on a clinical indicator at baseline (due to late claims). Thirteen percent of the adjusted targeted patients (n=37) switched to the recommended therapy. Eighty-eight (31.8%) had other changes in therapy, such as a discontinuation or switch within drug class, which were probably not attributed to the DUR mailing. There were 152 recipients (54.9%) that continued on therapy as before.

***Cost Issue***

For the 37 targeted recipients who switched to the recommended therapy, this switch resulted in a reduction in drug costs of $2,987 monthly ($35,808 annually).

***Compliance Issue***

There were 15 recipients that met the non-compliance criteria as well as "2 doses in 1 day" conversion criteria (15 out of 277 or 5.4%) in the pre-intervention period. Though the sample sizes small, there was noteworthy improvement in compliance of 66.7%.